



Original Research Article

A new planting technique of Arhar (*Cajanus cajan*) for higher production under rain-fed condition

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A B S T R A C T

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Arhar is an important pulse among Indian consumers, who like more as “Dal” to arhar but the limiting the production of pulse because of plant establishment method and other concerned technologies that are not applied thoroughly. Pigeon pea is sensitive crop against adverse climatic condition comes after germination and during vegetative stages which slash the production of arhar again. The experiment was laid out at S.G. CARS, Jagdalpur in Randomized Block Design with four replications during kharif 2006 and 2007. The treatment applied as T₂-Doni + scooping gave highest yield due to appropriate media addition to seeding and planted as such after hardening.

Introduction

India sharing about 25 % (22.43 million ha) of pulse area in the world's pulse production out of 33.6 % (13.1 million tones) of world's pulse basket. Among the 70% of global share of chickpea and pigeon pea production goes to India. *Arhar* is an important pulse among Indian consumers, who like more as “Dal” to *arhar* but the limiting the production of pulse because of plant establishment method and other concerned technologies that are not applied thoroughly. Pigeon pea is sensitive crop against adverse climatic condition comes after germination and during vegetative stages which slash the production of *arhar* again. The gap between the production and consumption is really big question for our country and

also importing pulse from other countries. The estimated requirement of pulses 27.00million tones by 2015 AD is challenge. These all aspect of production constraints in country, it needs boosting up the pulse production through new innovative techniques to come the real compensative figure of production. In *kharif* season, those regions receive higher rainfall in initial month of monsoon onset. It is very difficult to manage the waterlogged condition for seeding of *Arhar* crop, because almost sown crop become softy due to high marshy condition of beds. Again farmers can not go for resowing the *arhar* due to high prices, time almost passes for resowing. These all factors emphasized to conduct the experiment.

Materials and Methods

The experiment was framed out and conducted at S.G. CARS, Jagdalpur in Randomized Block Design with four replications during *kharif* 2006 and 2007. Generally *Doni* (container) was made out of Sal (*Shorea robusta*) tree leaves is easily available to farmers during June in forest area. The *doni* is used to sowing seeds which already filled with soil and FYM mixture (30:70) having the capacity of nearly half kg in which we were sown seeds and kept the *doni* in safer place, irrigated it regular interval as climatic condition changed. Sown seeds germinated on 3rd day and needed for 10-15 days to hardening. When seedling became hard at 6-7 leaves stage (30-40days), this was appropriate time of transplanting in prepared field, bunds, pond bunds, or as intercrops by spading out soil and put the pot as such. It was not needed additional FYM or fertilizer in rest of period. Number of *doni* was required 5000/ha. The scooping was 2-4 inches spade out dug ditches which retained water for some periods than flat land built in between two rows is promising technique of *Arhar*. It was generally made at 1.5 foot interval in between rows of *Arhar*. Treatment combinations were T₁-Doni planting, T₂-Doni planting + Scooping, T₃-Normal planting, T₄-Normal planting + Scooping, T₅-Line sowing, T₆-Line sowing + scooping, T₇-furrow sowing, T₈-Furrow sowing + scooping, T₉-Broadcasting and T₁₀-Broadcasting+Scooping. The test crop variety was Asha which takes 180 days to maturity.

Results and Discussion

Doni planting with scooping was really the higher values for growth and yield attributing characters which lies under the

effect of different treatment. The plant height was significantly differed and maximum plant height was observed in T₂- Doni planting + scooping (131.80, 132.18) in both the years of experimentation, whereas minimum was in T₉- broadcasting (94.00, 85.76). T₁, T₃, T₄, T₇ and T₈ in 2006, along with T₆ in 2007 were found comparable with each others (Table1). Similarly other characters were followed same trend in regard to number of branches, number of pods per plant, 1000 grain weight, number of seeds per pods. The results corroborate the finding of Singh and Arya (1988) and Barik *et.al* (1998). The 1000 grain weight was not significantly differed. When we applied the treatments with combination of scooping performed as higher yield over alone the planting methods. Doni planting with scooping gave higher values of observation throughout crop growing period.

The reflecting result of growth and yield attributing characters on yield was the evidence of treatment effect, particularly under observations of experiment. The maximum straw yield was recorded in T₂ – Doni + scooping (35.61q and 32.71q) among the treatments which was significantly superior over rest of treatments except T₄ – normal planting + scooping (32.55 and 31.21), T₆-line sowing + scooping (32.03 and 29.37) in respective years of experimentation and T₈- Furrow sowing + scooping (28.47) was also comparable in straw yield particularly concerned 2007 (Table2). Because every attributing characters supported to boost the yield under treatment applied as doni + scooping gave highest yield due to appropriate media addition to seeding and planted as such followed by T₃ – Normal planting, T₅ –

Table.1 Yield attributing characters influenced by different treatments

Treatments	Plant height (cm)		No. of branches/plant		No. of Pods/plant		100 grain wt (g)		No. of seeds/pod	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
T ₁ - Doni planting	124.53	130.67	21.00	21.00	79.70	74.57	9.90	9.57	4.34	4.73
T ₂ -Doni planting + Scooping	131.80	132.18	22.27	22.30	89.53	90.30	10.83	12.41	4.93	5.72
T ₃ -Normal planting	121.00	121.75	17.00	18.30	76.03	73.78	9.80	9.17	4.35	4.55
T ₄ -Normal planting + Scooping	118.40	127.59	18.40	19.95	88.40	89.65	10.40	11.49	4.78	5.60
T ₅ -Line sowing	115.73	118.80	16.67	17.05	67.43	69.02	9.73	9.17	4.78	4.48
T ₆ -Line sowing + Scooping	117.00	125.30	18.87	15.80	87.53	83.25	10.40	11.35	4.05	5.30
T ₇ -furrow sowing	120.33	111.59	16.33	15.80	54.23	64.67	9.83	9.13	4.64	4.53
T ₈ -Furrow sowing + Scooping	121.40	112.85	17.87	18.30	79.70	83.03	10.13	10.69	4.77	4.98
T ₉ -Broadcasting	94.00	85.76	12.93	11.00	45.25	52.32	7.01	7.82	4.03	4.17
T ₁₀ -Broadcasting+Scooping	105.20	98.67	14.25	13.80	58.70	60.75	9.07	8.66	4.18	4.26
<i>CD at 5%</i>	13.12	8.50	3.62	2.68	9.99	8.80	NS	2.09	NS	0.89

Table.2 Straw and grain yield of Arhar influenced by different treatments.

Treatments	Grain yield(q/ha)		Straw yield (q/ha)		Yield % increased over broadcasting	
	2006	2007	2006	2007	2006	2007
T₁- Doni planting	12.08	11.19	30.95	25.97	87.92	88.81
T₂-Doni planting + Scooping	15.78	16.33	35.61	32.71	84.22	83.67
T₃-Normal planting	12.00	12.78	25.82	25.87	88.00	87.22
T₄-Normal planting + Scooping	15.55	15.41	32.25	31.21	84.45	84.59
T₅-Line sowing	12.45	12.41	24.45	22.18	87.55	87.59
T₆-Line sowing + scooping	14.63	13.96	32.03	29.37	85.37	86.04
T₇-furrow sowing	10.65	12.37	23.25	21.33	89.35	87.63
T₈-Furrow sowing + scooping	12.64	13.42	28.24	28.47	87.36	86.58
T₉-Broadcasting	5.37	4.75	15.75	13.35	-	-
T₁₀-Broadcasting+Scooping	8.63	8.96	20.16	21.34	62.22	53.01
CD at 5%	1.71	2.16	5.25	4.26	-	-

line sowing and T₇-furrow sowing + scooping which was over T₉- Broadcasting Similar finding was found by Subba Reddy (1985) and Singh and Reddy (1986).

Grain yield is real measurement of efficiency of treatments. The highest grain yield was recorded in T₂-Doni planting + scooping (15.78, 16.33) in both years among all treatments but in case of alone planting methods, doni planting gave the maximum grain yield in comparison to other alones. In both, alone planting and with combination of scooping were found higher yield because the placement of FYM is greatly enhanced the growth of crop during life span of the *Arhar*.

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